

Appln. No. 10/673,615
Response A dated April 6, 2005
Reply to Office Action of March 9, 2005

Amendment to the Specification:

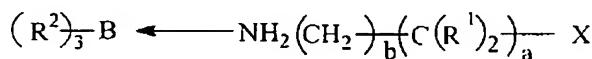
Replace the second full paragraph on page 6 with the following paragraph.

The adhesives which can be employed in the practice of the present invention for bonding together two or more pieces to make a fuel tank include those adhesives which can support a load of 1334N. The adhesive preferably demonstrates a lap shear strength of about 100 psi (1689 kPa) or greater, more preferably about 2510 psi (1724 kPa) or greater and more preferably about 400 psi (2758 kPa) or greater according to the test procedure found in U.S. 6,806,330, column 15, lines 3 to 20.

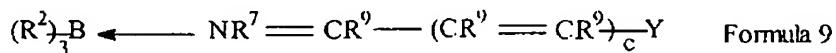
Please replace the third paragraph of page 7 with the following paragraph.

The most preferred adhesives which can be employed in the practice of the present invention for joining or bonding the plastic components to the plastic fuel tank or for joining two or more pieces of a fuel tank into a finished unit comprise a preferred class of an amine/organoborane complex described in ~~co-pending application U.S. Serial No. 09/466,321, filed December 17, 1999~~ U.S. 6,806,330B1, incorporated herein by reference. These adhesives are formulated such that no preparation or pre-treatment of the surfaces to be bonded is required.

Formula 3 on page 9 has been replaced with the following rewritten Formula 3:



Formula 9 on page 12 has been replaced with the following rewritten Formula 9.



The last paragraph on page 14 has been replaced with the following rewritten paragraph.

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Referring now to Figure 2, there is shown a fuel tank wall having an opening 20_16 with a close-out lid 21. Close-out lid 21 is joined to the fuel tank wall along the periphery of the fuel tank opening 20_16 by means of an adhesive 22_12. Adhesive 22_12 is a polymer with adhesive and barrier properties. The adhesive is as described previously. The fuel tank wall comprises high density polyethylene outer layers 23 and 24 and a barrier polymer layer 25 therebetween. The close-out lid comprises high density polyethylene outer layers 23'_26 and 24'_27 and a barrier polymer layer 25'_28 therebetween. As shown, the adhesive layer 12 is in contact with the barrier layer 25 of the fuel tank wall and the barrier layer 25'_28 of the close-out lid, bridging the gap between the barrier layers of the tank wall.

The last two paragraphs on page 15 have been replaced with the following rewritten paragraphs.

Referring to Fig. 3C, there is shown fill spud 33 having a flange 34 attached to plastic fuel tank 30_10. There is a leak 36 at the interface of flange 34 and fuel tank 30. A patch/donut 31 is placed on fill spud 33 as shown. Patch/donut 31 comprises a multilayer laminate structure as described previously. Thick adhesive beads 32 and 32'_29 are applied around the inner and outer peripheries, respectively, of donut 31. When donut 31 is slid down fill spud 33 and pressed against flange 34 and fuel tank 30_10, adhesive bead 32 bonds the inner periphery of donut 31 to the outer surface of the cylinder of fill spud 33 and adhesive bead 32'_29 bonds the outer periphery of donut 31 to fuel tank 30_10. Donut 31 is large enough to cover flange 34 and prevents the emission of fuel vapor from leak 36. Adhesive bead 32 is the primary seal and adhesive bead 32'_29 is the redundant seal.

b. Adhesive + Hot Plate Welding Redundant Sealing

The use of the adhesive described previously, combined with hot plate welding is another method to obtain redundant sealing for reduced emissions, improved durability, and safety. In Figs. 5A and 5B, there is shown plastic component 54_11 attached to fuel tank 50_10 by means of adhesive 52_12 and weld 53.

The first three paragraphs on page 16 have been replaced with the following rewritten paragraphs.

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c. Other Redundant Seal Designs

Figs. 4A to 4C show various designs of redundant seals. In Fig 4A, thick adhesive bead 42-32 is applied around the cylinder at the base of fill spud-43-33, and a thick adhesive bead 42'-29 is applied around the periphery of the fill spud base to obtain a redundant seal for improved durability and/or emissions barrier.

Fig 4B shows a round lid/cover with double circular adhesive beads 42-32 and 42'-29.

Fig. 4C shows a rectangular lid/cover with double rectangular adhesive beads 42-32 and 42'-29.